Task: 1

Q1. Given a point P in the 2-D plane, draw the mirror image of that point, Q through the mirror considered as X-axis / Y-axis. Ex: P: (1,2), then Q:(1, -2) if mirror plane is X-axis. Take input from the keyboard.

Q2. Write a program in OpenGL to draw a line from 3 Lines of choice:

Option 1 : Horizontal Line - ask for X-coordinate range and specific Y-coordinate and plot the line.

Option 2 : Vertical Line - ask for specific Y-coordinate range and X-coordinate and plot the line.

Option 3 : Diagonal Line - ask for inputs for example : the input : 5, 10; should plot the line (5,5) (6,6) (7,7) (8,8) (9,9) (10,10).

Q3. Write a program in OpenGL to draw a square and include the below options in the code

a. Desired background color and color of the square

b. Desired center and size of the square

Q4. Write a program in OpenGL to draw Different Trigonometric Functions (Sin, Cos, Tan, Cosec, Sec, Cot) with different colors in the same Plot. Set desired color in the background and the graphics.

Q5. Draw the reflection of a Triangle in all the 4 quadrants of the XY Plane. For. e.g. Suppose we draw a triangle with the following coordinates

in the XY Plane:

- (x1, y1)
- (x2, y2)
- (x3, y3)

So its reflection in all the 4 Quadrants of the XY Plane would have the coordinates

- (x1, y1), (x2, y2), (x3, y3) -> in (+x, +y) quadrant
- (-x1, y1), (-x2, y2), (-x3, y3) -> in (-x, +y) quadrant
- (-x1, -y1), (-x2, -y2), (-x3, -y3) -> in (-x, -y) quadrant
- (x1, -y1), (x2, -y2), (x3, -y3) -> in (+x, -y) quadrant

Task: 2

1. Implement these Drawing Algorithms from below:

a. DDA Line Drawing Algorithm

b. Bresenham's Line Drawing Algorithm

2. Describe the working principles of all the above line drawing algorithms and illustrate the differences and limitations.